

EVBOX Light J200

Control solutions for cold rooms with on-board moto-condensing unit



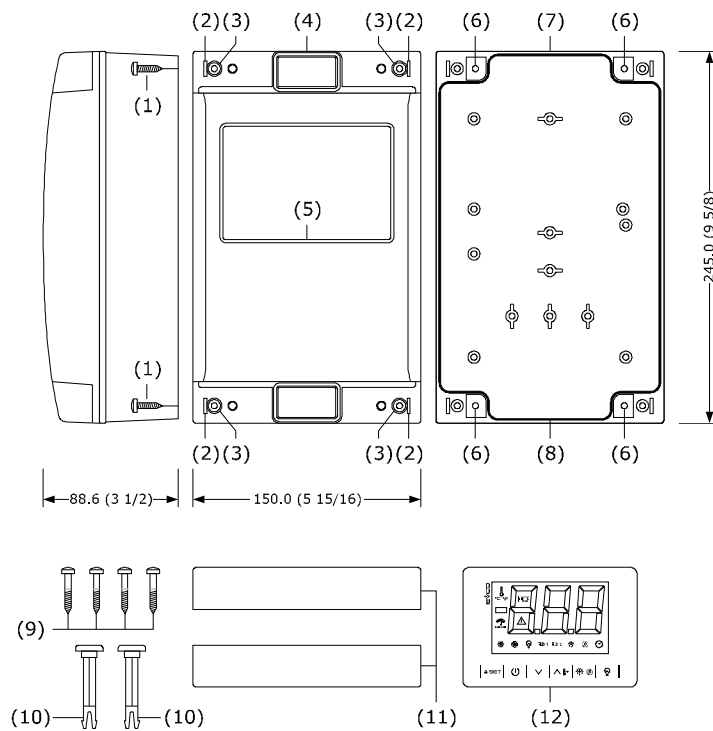
PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

- EN ENGLISH**
- Degree of protection IP65.
 - Power supply 230 VAC.
 - Incorporated clock (according to the model).
 - Cabinet probe and evaporator probe (PTC/NTC).
 - Door switch input.
 - Compressor relay 16 A res. @ 250 VAC or 30 A res. @ 250 VAC (according to the model).
 - Alarm buzzer.
 - Incorporated Bluetooth Low Energy sensor (according to the model).
 - TTL MODBUS slave port for EVconnect APP or BMS.

1 MEASUREMENTS AND INSTALLATION

Measurements in mm (inches); to be fitted on-board, fixing screws not provided.

- N.B.**
- make sure to have a junction for rigid tube; the maximum diameter of the fixing hole must be 28.5 mm (1 1/8 in)
 - to ensure the degree of protection IP65 of the whole covering, install the device using the appropriate holes only.

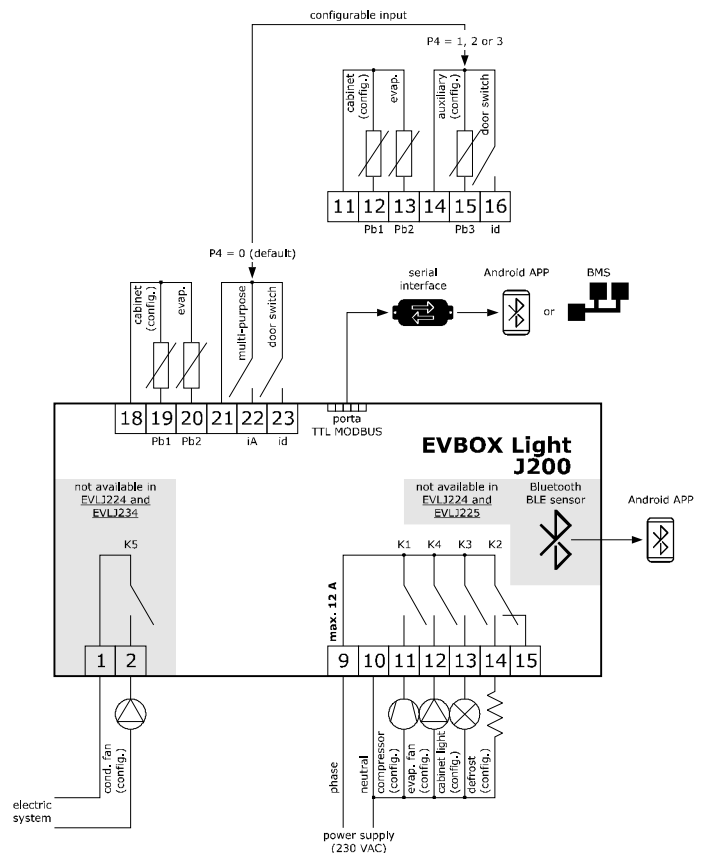


- Fasten the back shell (7) to the wall with 4 screws (1) using the proper holes (6).
- Make sure the gasket (8) is into the proper seat.
- Lean the front shell (4) against the back shell (7) and insert the 2 fastening tabs (10) thoroughly in the proper holes (2) on the right-hand side or the left-hand side of the front shell (4).
- Fasten the controller (12) pushing it from the front into the proper seat (5).
- If the connecting cables come from above, drill a hole having a diameter suitable to fix a junction for rigid tube on the upper part of the back shell (7); if vice versa the cables come from below, drill the hole on the lower part of the shell.
- Screw the junction for rigid tube to the back shell (7).
- Connect the controller (12) as shown in the section **ELECTRICAL CONNECTION** getting the cables to pass through the junction for rigid tube.
- Fasten the front shell (4) against the back shell (7) with 4 screws (9) using the proper holes (3).
- Fasten the cover caps (11) on the upper part and on the lower part of the front shell (4).

- INSTALLATION PRECAUTIONS**
- Ensure that the working conditions are within the limits stated in the **TECHNICAL SPECIFICATIONS** section.
 - Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
 - In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

2 ELECTRICAL CONNECTION

- N.B.**
- Use cables of an adequate section for the current running through them.
 - To reduce any electromagnetic interference connect the power cables as far away as possible from the signal cables.



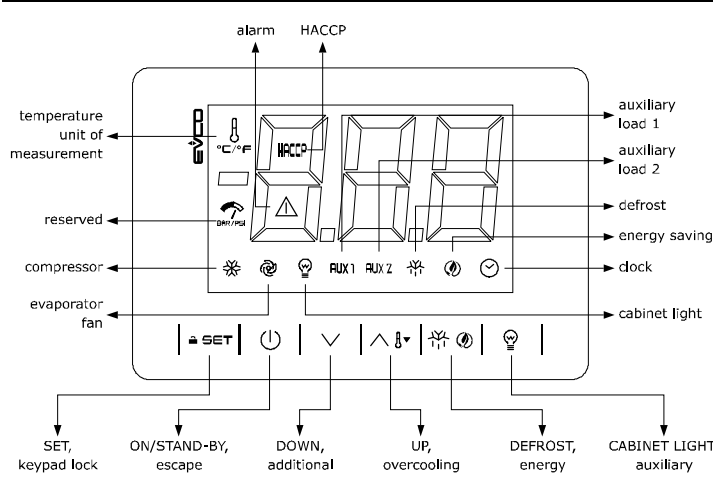
- PRECAUTIONS FOR ELECTRICAL CONNECTION**
- If using an electrical or pneumatic screwdriver, adjust the tightening torque.
 - If the device has been moved from a cold to a warm place, the humidity may have caused condensation to form inside. Wait about an hour before switching on the power.
 - Make sure that the supply voltage, electrical frequency and power are within the set limits. See the section **TECHNICAL SPECIFICATIONS**.
 - Disconnect the power supply before doing any type of maintenance.
 - Do not use the device as safety device.
 - For repairs and for further information, contact the EVCO sales network.

3 FIRST-TIME USE

- Install following the instructions given in the section **MEASUREMENTS AND INSTALLATION**.
 - Power up the device and an internal test will be run. The test normally takes a few seconds, when it is finished the display will switch off.
 - Configure the device as shown in the section **Setting configuration parameters**. Recommended configuration parameters for first-time use.
- | PAR. | DEF. | PARAMETER | MIN... | MAX. |
|------|------|---------------------------------|--------------|---------------------------------------|
| SP | 0.0 | setpoint | r1... r2 | |
| P0 | 1 | probe type | 0 = PTC | 1 = NTC |
| P2 | 0 | temperature unit of measurement | 0 = °C | 1 = °F |
| d1 | 0 | defrost type | 0 = electric | 1 = hot gas 2 = compressor stopped |

- Then check that the remaining settings are appropriate; see the section **CONFIGURATION PARAMETERS**.
- Disconnect the device from the mains.
 - Make the electrical connection as shown in the section **ELECTRICAL CONNECTION** without powering up the device.
 - For the connection in an RS-485 network connect the interface EVIF22TSX or EVIF23TSX, to activate real time functions in EVLJ224 and EVLJ225 connect the module EVIF23TSX, to use the device with the Android APP EVconnect connect the interface EVIF25TBX (or use EVLJ234 or EVLJ235); see the relevant instruction sheets. **If EVIF22TSX or EVIF23TSX is used, set parameter bLE to 0.**
 - Power up the device.

4 USER INTERFACE AND MAIN FUNCTIONS



- 4.1 Switching the device on and off**
- Touch the ON/STAND-BY key for 2s. If POF = 1 (default), touch the ON/STAND-BY key for 2s.
- If the device is switched on, the display will show the P5 value ("cabinet temperature" default); if the display shows an alarm code, see the section **ALARMS**.

| LED | ON | OFF | FLASHING |
|--------------|--|--------------------------|---|
| | compressor on | compressor off | - compressor protection active - setpoint being set |
| | evaporator fan on | evaporator fan off | evaporator fan stop active |
| | cabinet light on | cabinet light off | cabinet light on by digital input |
| AUX 1 | auxiliary function 1 on | auxiliary function 1 off | - auxiliary function 1 on by digital input - auxiliary function 1 delay active |
| AUX 2 | auxiliary function 2 on | auxiliary function 2 off | - auxiliary function 2 on by digital input - auxiliary function 2 delay active |
| | defrost or pre-drip active | - | - defrost delay active - dripping active |
| | - energy saving active - low consumption active | - | - |

| | | | |
|--------------|-------------------|---|--|
| | view time | - | set date, time and day of the current week |
| | view temperature | - | overcooling or overheating active |
| HACCP | saved HACCP alarm | - | new HACCP alarm saved |
| | alarm active | - | - |

If Loc = 1 (default) and 30s have elapsed without the keys being pressed, the display will show the "Loc" label and the keypad will lock automatically.

- 4.2 Unlock keypad**
Touch a key for 1s: the display will show the label "UnL".

- 4.3 Set the setpoint (if r3 = 0, default)**
Check that the keypad isn't locked.
- Touch the SET key.
 - Touch the UP or DOWN key within 15s to set the value within the limits r1 and r2 (default "-40... 50").
 - Touch the SET key (or do not operate for 15s).

- 4.4 Activate manual defrost (if r5 = 0, default)**
Check that the keypad is not locked and that overcooling is not active.
- Touch the DEFROST key for 2s.

- 4.5 Cabinet light on/off (if u1c... u5c = 5)**
- Touch the CABINET LIGHT key.

- 4.6 Button-operated load on/off (if u1c... u5c = 10 or 11)**
- Touch the CABINET LIGHT key (for 2s if u1c... u5c = 5).
- If u1c... u5c = 6, the demisting switch on for the u6 duration.

- 4.7 Silence buzzer (if u9 = 1, default)**
Touch a key.
If u1c... u5c = 11 and u4 = 1, the alarm output is deactivated.

5 ADDITIONAL FUNCTIONS

- 5.1 Activate/deactivate overcooling and overheating**
Check that the keypad is not locked.
- Touch the UP key for 2s.

| FUNCTION | CONDITION | CONSEQUENCE |
|-------------|-------------------------------|---|
| overcooling | r5 = 0 and defrost not active | the setpoint becomes "setpoint - r6", for the r7 duration |
| overheating | r5 = 1 | the setpoint becomes "setpoint + r6", for the r7 duration |

- 5.2 Activate/deactivate energy saving in manual mode (if r5 = 0)**
Check that the keypad is not locked.
- Touch the DEFROST key.
- The setpoint becomes "setpoint + r4", at maximum for HE2 duration.

- 5.3 Activate the high or low humidity functions (if F0 = 5)**
Check that the keypad isn't locked.
- Touch the DOWN key for 1s.
 - Touch the UP or DOWN key within 15s to select the label "rH".
 - Touch the SET key for 2s until the display shows the right label for the function (only touch the key to see the function activated).

| LAB. | DESCRIPTION |
|------|--|
| rhL | low humidity function (evaporator fan with F17 and F18 if the compressor is off, on if the compressor is on) |
| rhH | high humidity function (evaporator fan on) |

- 5.4 View/delete HACCP alarm information (not available in EVLJ224 and EVLJ225)**
Check that the keypad isn't locked.
- Touch the DOWN key for 1s.
 - Touch the UP or DOWN key within 15s to select a label.

| LAB. | DESCRIPTION |
|------|--------------------------------|
| LS | view HACCP alarm information |
| rLS | delete HACCP alarm information |

- 5.5 View/delete compressor functioning hours**
Check that the keypad isn't locked.
- Touch the SET key.
 - Touch the ON/STAND-BY key (or do not operate for 60s) to exit the procedure.

| COD. | DESCRIPTION |
|------|---|
| AL | low temperature alarm |
| AH | high temperature alarm |
| id | open door alarm (if i4 = 1) |
| PF | power failure alarm (available in EVLJ234 and EVLJ235 or in EVLJ224 and EVLJ225 with interface EVIF25TBX connected) |

- 5.6 Example of alarm information (e.g. a high temperature alarm).**

| | |
|------------|---|
| 8.0 | critical value (calculated cabinet/product temperature) was 8.0 °C/°F |
| Sta | (available in EVLJ234 and EVLJ235 or in EVLJ224 and EVLJ225 with interface EVIF25TBX connected) |
| y15 | alarm signalled in 2015 |
| n03 | alarm signalled in March |
| d26 | alarm signalled on 26 March 2015 |
| h16 | alarm signalled at 16:00 |
| n30 | alarm signalled at 16:30 |
| dur | |
| h01 | alarm lasted 1h |
| n15 | alarm lasted 1h 15min |

- 5.5 View/delete compressor functioning hours**
Check that the keypad isn't locked.
- Touch the DOWN key for 1s.
 - Touch the UP or DOWN key within 15s to select a label.

| LAB. | DESCRIPTION |
|------|--|
| CH1 | view compressor functioning hundreds of hours |
| CH2 | view second compressor functioning hundreds of hours (if u1c... u5c = 1) |
| rCH | delete compressor and second compressor functioning hours |

| | | | | |
|-----|------|-------|---|--|
| 97 | u2c | 4 | relay K2 configuration | 0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by 14 = evaporator fan 2 15 = defrost 2 |
| 98 | u3c | 5 | relay K3 configuration | 0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by 14 = evaporator fan 2 15 = defrost 2 |
| 99 | u4c | 2 | relay K4 configuration | 0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by 14 = evaporator fan 2 15 = defrost 2 |
| 100 | u5c | 3 | relay K5 configuration (not available in EVLJ224 and EVLJ234) | 0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by 14 = evaporator fan 2 15 = defrost 2 |
| 101 | u2 | 0 | enable cabinet light and button-operated load in stand-by | 0 = no 1 = yes manual |
| 102 | u4 | 1 | enable alarm output off silencing the buzzer | 0 = no 1 = yes |
| 103 | u5 | -1.0 | threshold for door heaters on | -99... 99 °C/°F differential = 2 °C/4 °F |
| 104 | u6 | 5 | demisting on duration | 1... 120 min |
| 105 | u7 | -5.0 | neutral zone threshold for heating (relative to setpoint) | -99... 99 °C/°F differential = 2 °C/4 °F setpoint + u7 |
| 106 | u9 | 1 | enable alarm buzzer | 0 = no 1 = yes |
| N. | PAR. | DEF. | REAL TIME CLOCK | MIN... MAX. |
| 107 | Hr0 | 0 | enable clock (default 0 in EVLJ224 and EVLJ225) | 0 = no 1 = yes |
| N. | PAR. | DEF. | ENERGY SAVING (if r5 = 0) | MIN... MAX. |
| 108 | HE2 | 0 | energy saving maximum duration | 0... 999 min |
| N. | PAR. | DEF. | REAL TIME ENERGY SAVING (if r5 = 0) | MIN... MAX. |
| 109 | H01 | 0 | energy saving time | 0... 23 h |
| 110 | H02 | 0 | energy saving maximum duration | 0... 24 h |
| N. | PAR. | DEF. | REAL TIME DEFROST (if d8 = 4) | MIN... MAX. |
| 111 | Hd1 | h- | 1st daily defrost time | h = disabled |
| 112 | Hd2 | h- | 2nd daily defrost time | h = disabled |
| 113 | Hd3 | h- | 3rd daily defrost time | h = disabled |
| 114 | Hd4 | h- | 4th daily defrost time | h = disabled |
| 115 | Hd5 | h- | 5th daily defrost time | h = disabled |
| 116 | Hd6 | h- | 6th daily defrost time | h = disabled |
| N. | PAR. | DEF. | RESERVED | MIN... MAX. |
| 117 | Sd0 | - - - | reserved | reserved |
| 118 | Sd1 | - - - | reserved | reserved |
| 119 | Sd2 | - - - | reserved | reserved |
| 120 | Sd3 | - - - | reserved | reserved |
| 121 | Sd4 | - - - | reserved | reserved |
| 122 | Sd5 | - - - | reserved | reserved |
| N. | PAR. | DEF. | SAFETIES | MIN... MAX. |
| 123 | POF | 1 | enable ON/STAND-BY key | 0 = no 1 = yes |
| 124 | Loc | 1 | enable keypad lock | 0 = no 1 = yes |
| 125 | PAS | -19 | password | -99... 999 |
| 126 | PA1 | 426 | level 1 password | -99... 999 |
| 127 | PA2 | 824 | level 2 password | -99... 999 |
| N. | PAR. | DEF. | DATA-LOGGING EVLINK | MIN... MAX. |
| 128 | rE0 | 60 | data-logger sampling interval | 0... 240 min |
| 129 | rE1 | 4 | recorded temperature | 0 = none 1 = cabinet 2 = evaporator 3 = auxiliary 4 = cabinet and evaporator 5 = all |
| N. | PAR. | DEF. | MODBUS | MIN... MAX. |
| 130 | LA | 247 | MODBUS address | 1... 247 |
| 131 | Lb | 2 | MODBUS baud rate | 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud |
| 132 | LP | 2 | parity | 0 = none 1 = odd 2 = even |
| N. | PAR. | DEF. | BLUETOOTH | MIN... MAX. |
| 133 | bLE | 1 | enable Bluetooth | 0 = no 1 = yes |

| 8 ALARMS | | | |
|----------|--|-----------|--|
| COD. | DESCRIPTION | RESET | TO CORRECT |
| Pr1 | cabinet probe alarm | automatic | - check P0 |
| Pr2 | evaporator probe alarm | automatic | - check probe integrity |
| Pr3 | auxiliary probe alarm | automatic | - check electrical connection |
| rtc | clock alarm | manual | set date, time and day of the week |
| AL | low temperature alarm | automatic | check A0, A1 and A2 |
| AH | high temperature alarm | automatic | check A4 and A5 |
| id | open door alarm | automatic | check i0 and i1 |
| PF | power failure alarm | manual | - touch a key - check electrical connection |
| COH | high condensation warning | automatic | check C6 |
| CSd | high condensation alarm | manual | - switch the device off and on - check C7 |
| iA | multi-purpose input alarm | automatic | check i5 and i6 |
| iSd | high pressure alarm | manual | - switch the device off and on - check i5, i6, i8, i9 |
| LP | low pressure alarm | automatic | check i5 and i6 |
| C1t | compressor thermal switch alarm | automatic | check i5 and i6 |
| C2t | second compressor thermal switch alarm | automatic | check i5 and i6 |
| dFd | defrost timeout alarm | manual | - touch a key - check d2, d3 and d11 |

| 9 TECHNICAL SPECIFICATIONS | | |
|--|--|---|
| Purpose of the control device | Function controller | |
| Construction of the control device | Built-in electronic device | |
| Container | White, self-extinguishing | |
| Category of heat and fire resistance | D | |
| Measurements | 150.0 x 245.0 x 88.6 mm (5 5/16 x 9 5/8 x 3 1/2 in) | |
| Mounting methods for the control device | To be fitted on-board, fixing screws not provided | |
| Degree of protection provided by the covering | IP65 | |
| Connection method | | |
| Fixed screw terminal blocks for wires up to 2.5 mm ² | Micro-MaTch connector | |
| Maximum permitted length for connection cables | | |
| Power supply: 10 m (32.8 ft) | Analogue inputs: 10 m (32.8 ft) | |
| Digital inputs: 10 m (32.8 ft) | Digital outputs: 10 m (32.8 ft) | |
| Operating temperature | From -5 to 55 °C (from 23 to 131 °F) | |
| Storage temperature | From -25 to 70 °C (from -13 to 158 °F) | |
| Operating humidity | Relative humidity without condensate from 10 to 90% | |
| Pollution status of the control device | 2 | |
| Conformity | | |
| RoHS 2011/65/CE | WEEE 2012/19/EU | |
| REACH (EC) Regulation 1907/2006 | LVD 2014/35/UE | |
| Power supply | | |
| 230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 6 VA insulated | 115... 230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 6 VA insulated in EVLJ225 with compressor relay rated 16 A res. @ 250 VAC | |
| Earthing methods for the control device | None | |
| Rated impulse-withstand voltage | 2.5 KV | |
| Over-voltage category | II | |
| Software class and structure | A | |
| Clock | Incorporated secondary lithium battery (clock not available in EVLJ224 and EVLJ225) | |
| Clock drift | ≤ 60 s/month at 25 °C (77 °F) | |
| Clock battery autonomy in the absence of a power supply | > 24 h at 25 °C (77 °F) | |
| Clock battery charging time | 24 h (the battery is charged by the power supply of the device) | |
| Analogue inputs | | |
| 2 for PTC or NTC probes (cabinet probe and evaporator probe) | | |
| PTC probes | Sensor type | KTY 81-121 (990 Ω @ 25 °C, 77 °F) |
| | Measurement field | From -50 to 150 °C (from -58 to 302 °F) |
| | Resolution | 0.1 °C (1 °F) |
| NTC probes | Sensor type | B3435 (10 K Ω @ 25 °C, 77 °F) |
| | Measurement field | From -40 to 105 °C (from -40 to 221 °F) |
| | Resolution | 0.1 °C (1 °F) |
| Digital inputs | | |
| 1 dry contact (door switch) | | |
| Dry contact | Contact type | 5 VDC, 2 mA |
| | Power supply | None |
| | Protection | None |
| Other inputs | Input configurable for analogue input (auxiliary probe) or digital input (multi-purpose input) | |
| Digital outputs | 5 (4 for EVLJ224 and EVLJ234) with electro-mechanical relay | |
| Relay K1 | SPST, 16 A res. @ 250 VAC | |
| Relay K2 | SPST, 30 A res. @ 250 VAC in EVLJ225N9V3 | |
| Relay K3 | SPDT, 8 A res. @ 250 VAC | |
| Relay K4 | SPST, 8 A res. @ 250 VAC | |
| Relay K5 (not available in EVLJ224 and EVLJ234) | SPST, 5 A res. @ 250 VAC | |
| The device guarantees double insulation between each digital output connector and the rest of the components of the device | | |
| Type 1 or Type 2 Actions | Type 1 | |
| Additional features of Type 1 or Type 2 actions | C | |
| Displays | LED custom display, 3 digit, with function icons | |
| Alarm buzzer | Incorporated | |
| Incorporated sensors: | Bluetooth Low Energy (available in EVLJ234 and EVLJ235). | |
| Communications ports | 1 TTL MODBUS slave port for EVconnect APP or BMS. | |

10 SIMPLIFIED EU DECLARATION OF CONFORMITY

EVCO S.p.A. declares that the type of radio equipment:
 - EVLJ234N7VXRXXV
 - EVLJ235N7VXRXXV
 complies with directive 2014/53/EU and directive 2011/65/EU.

The full text of the EU declaration of conformity is available at the following internet address:
<https://www.evco.it/en/16137-evbox-light-j200-js200>

For EVLJ234 and EVLJ235 According to European R&TTE Declaration of Conformity this device can be used in the following Countries: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands and The United Kingdom.

N.B.
 The device must be disposed of according to local regulations governing the collection of electrical and electronic waste.

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